

Patent Claims

- 5 1. A process for the manufacture of alumino-silicates which are dispersible  
in aqueous and/or aqueous-acidic media,  
characterised in that  
one or more hydrolyzable aluminium compound(s) and  
one or more hydrolyzable organosilicon compound(s)  
10 are hydrolyzed jointly or discontinuously in space or time.
2. A process according to claim 1,  
characterised in that the hydrolyzable compounds of claim 1 are  
compounds of the type  $M(O-R-A-R')_{z-n} (O-R'')_n$ , wherein independent of  
15 each other  
M is aluminium or silicon,  
R'' is a hydrocarbon residue having 1 to 30 carbon atoms,  
R' is a hydrocarbon residue having 1 to 10 carbon atoms,  
R is a bivalent hydrocarbon residue having 1 to 10 carbon atoms, and  
20 A represents a heteroatom of main group 6 (oxygen group) or main  
group 5 (nitrogen group) of the periodic system, preferably oxygen or  
nitrogen, wherein, if A represents an element of main group 5, A  
bears hydrogen or a C<sub>1</sub> to C<sub>10</sub> alkyl residue or a C<sub>6</sub> to C<sub>10</sub> aryl -/alkyl  
aryl residue as additional substituent(s) for the saturation of its va-  
25 lences, and  
n is an index for the numbers 0, 1, 2, or 3 if M is aluminium, or is an  
index for the numbers 0, 1, 2, 3, or 4 if M is silicon, and  
z is an index for the number 3 if M is aluminium, or is an index for the  
number 4 if M is silicon.  
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3. A process according to claim 2,  
characterised in that n is equal to 0.
4. A process according to claim 2,  
35 characterised in that n is equal to 3 if M is aluminium and/or n is equal  
to 4, if M is silicon.

5. A process according to any one of claims 1, 2, or 4,  
characterised in that silicon alcoholates having C<sub>1</sub> to C<sub>8</sub> hydrocarbon  
residues, preferably saturated C<sub>2</sub> to C<sub>4</sub> hydrocarbon residues, are used  
as hydrolyzable silicon compounds.
6. A process according to any one of the preceding claims,  
characterised in that, prior to addition of the hydrolyzable aluminium  
compound, the hydrolyzable silicon compounds are prehydrolyzed with  
water or dilute acid using 0.5 to 3 moles of water, preferably 1 to 2  
moles, per mole of silicon, i.e. less than the stoichiometric amount.
7. A process according to any one of the preceding claims,  
characterised in that aluminium alcoholates having C<sub>2</sub> to C<sub>12</sub>, preferably  
C<sub>4</sub> to C<sub>8</sub>, most preferably saturated C<sub>6</sub> to C<sub>8</sub> hydrocarbon residues are  
used as hydrolyzable aluminium compounds.
8. A process according to any one of the preceding claims,  
characterised in that the hydrolysis is performed at 20 to 98 °C,  
preferably 85 to 98 °C.
9. A process according to any one of the preceding claims,  
characterised in that during or after the hydrolysis the reaction products  
of claim 1 are jointly subjected to hydrothermal ageing in an aqueous  
environment at temperatures of 40 to 220 °C for a period of greater than  
0.5 hour.
10. A process according to claim 9,  
characterised in that the hydrothermal ageing is conducted for a period  
of 0.5 hour to 24 hours, preferably 1 to 20 hours.
11. A process according to any one of claims 9 or 10,  
characterised in that the hydrothermal ageing is conducted at 80 to  
130 °C.

12. A process according to any one of claims 9 to 11,  
characterised in that the hydrothermal ageing is conducted in the  
presence of acid.
13. A process according to claim 12,  
characterised in that the acid is added after the hydrolysis, but prior  
to hydrothermal treatment.
14. A process according to any one of the preceding claims,  
characterised in that the acid which is present during or after the  
hydrolysis is a monovalent organic C<sub>1</sub> to C<sub>6</sub> acid or a monovalent  
mineral acid.
15. A process according to any one of the preceding claims,  
characterised in that the hydrolyzable metal compounds were pre-  
viously purified by distillation, filtration, or centrifugation and/or are  
liberated from metal ions by ion exchange.
16. A process according to any one of the preceding claims,  
characterised in that the aluminium compound/silicon compound  
ratio is from 99.5 wt.% : 0.5 wt.% to 50 wt.% : 50 wt.%, each refer-  
ring to Al<sub>2</sub>O<sub>3</sub> and SiO<sub>2</sub>.
17. A process according to any one of the preceding claims,  
characterised in that the reaction product of the invention is calcined  
at temperatures of between 550 °C and 1,500 °C for a period of 0.5  
hour to 24 hours.
18. The use of the alumino-silicates manufactured according to the pro-  
cess defined in the preceding claims as catalysts, catalyst supports,  
for the manufacture of catalysts, as starting materials for ceramics, as  
coating materials, and as binder components and/or rheological mo-  
difiers in aqueous systems.

19. The alumino-silicates manufactured according to any one of the processes defined in claims 1 to 17.

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20. Alumino-silicates dispersed in aqueous or aqueous/alcoholic media, characterised in that the alumino-silicate is manufactured according to any one of the processes defined in claims 1 to 17.

10 21. The alumino-silicates dispersed in aqueous or aqueous/alcoholic media according to claim 20, characterised in that the alumino-silicate, prior to dispersion in the aqueous or aqueous/alcoholic medium, is present in a dried, essentially anhydrous state.

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